

## Abstract Submittal Form

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### Unclassified Abstract (250 – 300 words; do not include figures or tables)

The Robotic Lunar Lander (RLL) development project office at NASA Marshall Space Flight Center is currently studying several lunar surface science mission concepts. The focus is on spacecraft carrying multiple science instruments and power systems that will allow extended operations on the lunar surface or other air-less bodies in the solar system. Initial trade studies of launch vehicle options indicate the spacecraft will be significantly mass and volume constrained. Because of the investment by the DOD in low mass, highly volume efficient components, NASA has investigated the potential integration of some of these technologies in space science applications. A 10,000 psig helium pressure regulator test activity has been conducted as part of the overall risk reduction testing for the RLL spacecraft. The regulator was subjected to typical NASA acceptance testing to assess the regulator response to the expected RLL mission requirements. The test results show the regulator can supply helium at a stable outlet pressure of 740 psig within a +/- 5% tolerance band and maintain a lock-up pressure less than the +5% above nominal outlet pressure for all tests conducted. Numerous leak tests demonstrated leakage less than 10<sup>-3</sup> standard cubic centimeters per second (SCCS) for the internal seat leakage at lock-up and less than 10<sup>-5</sup> SCCS for external leakage through the regulator body. The successful test has shown the potential for 10,000 psig helium systems in NASA spacecraft and has reduced risk associated with hardware availability and hardware ability to meet RLL mission requirements.

- By submitting an abstract, you agree to both complete a final paper for publication and to attend the meeting to present this information.
- Submit abstracts electronically; submittal instructions are found in the call for papers.
- Direct questions to Patricia Szybist, by phone at 410.992.7302 x 215, or email to [pats@jhu.edu](mailto:pats@jhu.edu).